



**Australian Government**  
**Department of Health and Ageing**



Australia and New Zealand Horizon Scanning Network

**ANZHSN**

AN INITIATIVE OF THE NATIONAL, STATE AND TERRITORY GOVERNMENTS OF AUSTRALIA AND THE GOVERNMENT OF NEW ZEALAND

## Horizon Scanning Technology Prioritising Summary

# Minimally invasive branch stent technique for the treatment of aortic aneurysms

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**ASERNIP(S)**

**Australian  
Safety  
and Efficacy  
Register  
of New  
Interventional  
Procedures -  
Surgical**



**Royal Australasian  
College of Surgeons**

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Enquiries about the content of the report should be directed to:

HealthPACT Secretariat  
Department of Health and Ageing  
MDP 106  
GPO Box 9848  
Canberra ACT 2606  
AUSTRALIA

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The production of this Horizon scanning prioritising summary was overseen by the Health Policy Advisory Committee on Technology (HealthPACT), a sub-committee of the Medical Services Advisory Committee (MSAC). HealthPACT comprises representatives from health departments in all states and territories, the Australia and New Zealand governments; MSAC and ASERNIP-S. The Australian Health Ministers' Advisory Council (AHMAC) supports HealthPACT through funding.

This Horizon scanning prioritising summary was prepared by staff from the Australian safety and Efficacy Register of New Interventional Procedures – Surgical (ASERNIP-S).

**NAME OF TECHNOLOGY:**

Minimally invasive branched stent technique for repair of aortic arch aneurysms.

**PURPOSE & TARGET GROUP:**

This new technique may become an alternative treatment for aneurysms of the aortic arch, particularly for patients who are not candidates for traditional aortic arch repair. Complications and mortality associated with traditional surgery may be avoided and hospital stay may be reduced.

**STAGE OF DEVELOPMENT (IN AUSTRALIA):**

- Experimental
- Investigational
- Nearly established
- Established
- Established but changed indication or modification of technique
- Should be taken out of use

**INTERNATIONAL UTILISATION:**

| COUNTRY | LEVEL OF USE    |             |                 |
|---------|-----------------|-------------|-----------------|
|         | Trials underway | Limited use | Widely Diffused |
| USA     |                 | ✓           |                 |

**IMPACT SUMMARY****Background:**

Stentgrafts are commonly used to treat aneurysms of the aorta; however the use of stentgrafts to treat aneurysms of the aortic arch has been problematic due to its size, shape and its critical branches that supply blood flow to the brain and arms. A minimally invasive branched stentgraft approach may overcome these issues, enabling repair of the aorta without hampering blood flow to these areas.<sup>1</sup>

The procedure involves the use of a thin catheter to insert a branched stentgraft through the right carotid artery at the side of the neck into the aortic arch. The stentgraft consists of a main tube and a branch that extends into the innominate artery (one of the three main arteries that branch off the aortic arch). Once the stentgraft is expanded to reinforce and reline the interior walls of the aortic arch, the holding capsule is removed. The stent expands and becomes anchored to the artery wall. A bypass is performed, restoring blood flow to the two additional arteries that branch off the aortic arch; the bypassed aneurysm is then shielded from the blood flow and typically shrinks over time.<sup>1,2</sup>

**Clinical need and burden of disease:**

In 1996, aortic aneurysms (abdominal and thoracic) represented the 38<sup>th</sup> and 50<sup>th</sup> leading cause of death in Australian men and women, respectively.<sup>3</sup> However, aneurysms of the aortic arch are less common, accounting for approximately 25% of thoracic aneurysms.<sup>4</sup>

Traditional procedures involve a large chest incision, cardiopulmonary bypass, circulatory arrest and hypothermia; serious complications and death are not uncommon.<sup>5</sup> In addition, hospital death is highest in the repair of aortic arch aneurysms.<sup>6</sup> The advantages of this procedure are a lower risk of death or complications and shorter hospital stay compared to traditional graft surgery.<sup>2</sup>

**Estimated speed, geographic and practitioner use patterns of diffusion in the health system:**

This is a new application of a technique originally developed by American surgeon Timothy Chuter in 2000, for the repair of thoracic and abdominal aortic aneurysms. Currently, only one patient in the United States has undergone this procedure for repair of an aneurysm of the aortic arch.<sup>2,7</sup>

**Existing comparators:**

In traditional aortic arch repair, the sternum is opened and the patient is placed on a bypass machine; the abnormal part of the arch is either repaired or removed and replaced with a graft.<sup>5</sup>

**Estimated cost impact:**

The cost of surgery for repair of a thoracic aneurysm using a graft approach in Australia is not available, the Medicare Benefits Schedule reimbursement fee (procedure only) would be approximately A\$1 700.<sup>8</sup> The costs associated with this new procedure are not available. Potential cost savings may occur if hospitalisation was reduced.

**Efficacy and safety issues:**

Short-term safety and efficacy data exist from one case report.<sup>7</sup>

The minimally invasive technique was performed in a 60-year-old male patient, with an aneurysm located at the site of a previously repaired arch aneurysm (using an open surgical procedure). The patient was considered to be at high-risk for conventional open aneurysm repair due to severe heart and lung disease.

- the operation took six hours
- completion angiograms revealed proper graft placement, with perfusion of all brachiocephalic arteries and no endoleak
- recovery was complicated by a period of ventilatory support and an episode of atrial flutter
- hospitalisation was three to four days, compared with at least seven for traditional graft surgery
- no cardiac or neurological symptoms reported<sup>2,7</sup>

- eight months postoperatively, the patient was well and had gone back to work part-time.<sup>2</sup>

**Ethical issues:**

Not applicable.

**Cultural or religious considerations:**

Not applicable.

**Other issues:**

- This is a technically complex procedure and is highly dependant upon the surgeons' expertise in endovascular and minimally invasive techniques.
- The main complication with this procedure is the risk of blood leaking from the graft (endoleak).
- Branched stentgrafts may be less durable, research is being conducted to assess their durability.<sup>7</sup>

**Conclusion:**

Limited evidence exists on the safety and efficacy of this procedure for repair of aortic arch aneurysms. Long-term safety and efficacy data would be required before this procedure could be routinely used.

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**SOURCES OF FURTHER INFORMATION:**

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**SEARCH CRITERIA:**

A search of MEDLINE, PubMed and Cochrane Library, Current Controlled Trials metaRegister, UK National Research Register International, Network for Agencies for Health Technology Assessments, relevant online journals and the Internet was conducted in November 2003.

Search terms used: aortic arch aneurysm\$, branched aortic arch aneurysm\$.